Eccentric Screw-Type Pump with Spare Unit

The present invention relates to an eccentric screw-type pump comprising a helical rotor that rotates in a helical stator chamber as well as a driving shaft that connects the rotor to a drive system.

In correspondence with the generally common prior art according to the pamphlet by NETZSCH "The heart of your process", pages 18 and 19, and the European Patent EP 0 657 649 A1 and the German Patent DE 24 58 839 A1, the rotors in screw-type pumps are connected via articulation means to the gear unit or driving system, respectively. Pin joints, pin-type cardan universal joints, curved-tooth joints and flexible rods may be used as articulating means. The replacement of a rotor or of the articulation means always requires time-consuming mounting operations.

The present invention is hence based on the problem of reducing the mounting time required for replacement of parts of the rotor, the stator or the joint, specifically at the customer's site.

In accordance with the present invention, this problem is solved by the features of Claim 1.

Expedient improvements of the invention are evident from the features defined in the dependent Claims.

Specifically in the case of repair work carried out at the customer's site or by the customer, it is desirable that the exchange of parts can be handled in a minimum of time with the simplest means possible. To this end, the invention proposes that the

driving shaft should be connected via a separable connector in the form of a screw, a clamping element or comparable elements to the drive system or its interposed gear set.

With the stator being clamped by means of a stay-bar arrangement between lateral flanges, it may be expedient, according to the present invention, that the pump casing is split and that its parts are connected to each other by means of a quick-action device or a quick coupler. In this inventive configuration, one removes and replaces the complete stator and one part of the pump casing together with the driving shaft, the joints or the flexible shaft, respectively, and the seal.

In accordance with another expedient configuration of the invention, the application of a gear unit (e.g. a flat gear set) is provided. The gear set is equipped with a hollow shaft. This hollow shaft accommodates the rotor-driving shaft that is supported and sealed in the pump casing. A screw ensures the axial fixation of the driving shaft relative to the hollow shaft. The torque is transmitted via a shaft-hub connector, e.g. a key-and-feather connector.

One embodiment of the invention is illustrated in Fig. 1.

Fig. 1 shows an eccentric screw-type pump 10 of the Moineau type, which comprises a drive unit 12 and a gear set 14 that is connected via a hollow shaft to a driving shaft 16.

The driving shaft 16 is provided with a seal 18 that prevents the product from penetrating into the region of the bearing 20. The flexible shaft 22 and the driving shaft 16 are fixed to each other by means of a screw connector, a shrinking connection or an adhesive joint so as to prevent them from rotating relative to each other. The pump casing 26 is provided with an inlet tubulure 28 through which the product is aspirated into the eccentric screw-type pump 10. It is possible to unscrew the screw 30 and to open the quick-action clamping device 32 for simultaneous removal of the entire stator 38, the terminating tubulure 34, the rotor 36, the flexible shaft 22, the driving shaft 16 and the seal 18 as a single unit from the pump casing 26 and the drive unit 12 for replacement of the spare or exchange unit.

List of reference numerals

10	eccentric screw-type pump
12	drive system
14	gear set
16	driving shaft
18	seal
20	bearing
22	shaft
26	pump casing
28	inlet tubulure
30	screw
32	quick-action clamping device
34	terminating tubulure
36	rotor
38	stator
40	intermediate tube